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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,590	02/27/2004	William Voorhees	03-0605	6833

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LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106
MILPITAS, CA 95035

EXAMINER	
ZAMAN, FAISAL M	

ART UNIT	PAPER NUMBER
2111	

DATE MAILED: 11/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/788,590	VOORHEES ET AL.	
	Examiner	Art Unit	
	Faisal Zaman	2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,12-14,17 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,12-14,17 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 1-5, 12-14, 17, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakke et al. ("Bakke '532") (U.S. Patent Application Publication No. 2005/0071532) in view of Badamo et al. ("Badamo") (U.S. Patent Application Publication No. 2002/0181476) and Seto (U.S. Patent Application Publication No. 2005/0138202).

Regarding Claim 1, Bakke '532 discloses a multi-chip module (MCM) (Bakke '532, Figure 4, item 100) comprising:

A plurality of serial attached SCSI ("SAS") expander component circuits (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders") each having a number of internal ports internal to the MCM (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports") and each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") coupling to SAS devices external to the MCM (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17).

An internal fabric coupling together selected ones of the internal ports in selected ones of the plurality of component circuits (Bakke '532, Figure 4, see connection between Subractive Routing Ports 120); and

Coordination logic communicatively coupled to the plurality of SAS expander component circuits to coordinate operation of the plurality of SAS expander component circuits (Bakke '532, Page 2, paragraph 22, receipt of data from one of the devices causes the edge expanders to use logic to determine where the data is to be sent, therefore it would be obvious to one of ordinary skill in the art that there is coordination logic within the edge expanders).

Bakke '532 does not expressly disclose wherein the configuration of coupling together of the selected ones of the internal ports is static following initialization of the MCM, and

Wherein the coordination logic is adapted to present a unified expander to devices outside the module.

In the same field of endeavor (e.g. network infrastructure devices that allow communications through a protocol), Badamo teaches a configuration of coupling together of a selected ones of internal ports is static (ie. using a static, yet programmable, switch fabric) following initialization of a system (Badamo, Figure 3, item 20, Page 4, paragraphs 0041 and 0043).

Also in the same field of endeavor (e.g. managing multiple physical paths from a host computer system to peripheral devices), Seto teaches wherein coordination logic is adapted to present a single expander to devices outside a module, wherein the single

expander performs SCSI management protocol ("SMP") exchanges (Seto, Figure 2, item 38c, Page 2, paragraph 0014) as a single SAS address (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Badamo's teachings of network infrastructure devices that allow communications through a protocol with the teachings of Bakke '532 for the purpose of efficiently handling received packets in a network device (see Badamo, Page 1, paragraph 0005). Also, it would be obvious to one of ordinary skill in the art to have a simpler configuration that provides low cost customized component circuits.

Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Seto's teachings of managing multiple physical paths from a host computer system to peripheral devices with the teachings of Bakke '532 for the purpose of providing efficient computing resources by the management of multiple independent pathways to a computer system's peripheral devices. Bakke '532 provides motivation to combine with both Badamo and Seto by stating it is an object of the invention to implement resilient connectivity in a data processing network (see Bakke '532, Page 1, paragraph 11). Also, it would have been desirable as stated by Bakke '532 for the data network system to prevent loss of data through increased fault tolerance (see Bakke '532, Page 1, paragraphs 2-3).

Regarding Claim 2, Bakke '532 discloses wherein the plurality of SAS expander component circuits comprises a number of SAS expander components each having a number of internal ports (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports").

Regarding Claim 3, Bakke '532 discloses wherein the plurality of SAS expander component circuits comprises a number of SAS expander components each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports").

Regarding Claim 4, the examiner takes Official Notice that static fabric in the type of the system disclosed is a generally well-known type of internal fabric available in the prior art at the time of the applicant's claimed invention, therefore it would have been obvious to one of ordinary skill in the art to use static internal fabric.

Regarding Claim 5, the examiner takes Official Notice that a static fabric being configured at manufacture in the type of system disclosed is well-known in the prior art at the time of the applicant's claimed invention, therefore it would have been obvious to one of ordinary skill in the art to configure the static fabric at manufacture of the MCM.

Regarding Claim 12, the examiner takes Official Notice that the the SAS expander component circuits of Bakke '532 would be adapted to utilize the SCSI

Management Protocol ("SMP") message processing logic, as evidenced by "Serial Attached SCSI Link Layer – part 2", by Rob Elliot, HP Industry Standard Servers, cited below under Relevant Art.

Regarding Claims 13 and 14, Seto teaches wherein the coordination logic is adapted to present a single SAS address and/or a single set of PHY numbers for the PHYs of the plurality of SAS expander component circuits (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

The motivation that was used in the combination of Claim 1, super, applies equally as well to Claims 13 and 14.

Regarding Claim 17, Bakke '532 teaches a method for manufacturing a customized serial attached SCSI ("SAS") expander having a predetermined number of ports, the method comprising:

Disposing a number of SAS expander components (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders") on a multi-chip module (MCM) (Bakke '532, Figure 4, item 100) wherein each SAS expander component has a number of internal ports internal to the MCM (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports") and each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") coupling to SAS devices external to the MCM and wherein the number is sufficient to provide a total

ports numbering substantially equal to the predetermined number of ports (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17);

Disposing an internal fabric on the MCM (Bakke '532, Figure 4, see connection between Subtractive Routing Ports 120);

Bakke '532 does not expressly teach configuring the internal fabric to provide desired routes between the total ports wherein following the step of configuring, the routes between the total ports remains static at least until the MCM is reset;

Disposing a control logic circuit on the MCM coupled to the internal fabric, wherein the step of configuring further comprises applying signals from a control logic circuit to the internal fabric to configure the internal fabric as a static fabric at reset of the MCM; and

Wherein the control logic circuit performs SCSI management protocol ("SMP") exchanges as a single address for the customized SAS expander.

In the same field of endeavor, Badamo teaches configuring internal fabric to provide desired routes between the total ports wherein following the step of configuring, the routes between the total ports remains static at least until the MCM is reset (Badamo, Figure 3, item 20); and

Disposing a control logic circuit on the MCM coupled to the internal fabric, wherein the step of configuring further comprises applying signals from a control logic circuit to the internal fabric to configure the internal fabric as a static fabric at reset of the MCM (Badamo, Figure 3, item 36, Page 4, paragraphs 0038, 0041, 0043).

Also in the same field of endeavor, Seto teaches wherein a control logic circuit performs SCSI management protocol ("SMP") exchanges (Seto, Figure 2, item 38c, Page 2, paragraph 0014) as a single address for a customized SAS expander (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

The motivations that were used in the combination of Claim 1, super, apply equally as well to Claim 17.

Regarding Claim 18, Bakke '532 teaches a method for manufacturing a customized serial attached SCSI ("SAS") expander having a predetermined number of ports, the method comprising:

Disposing a number of SAS expander components (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders") on a multi-chip module (MCM) (Bakke '532, Figure 4, item 100) wherein each SAS expander component has a number of internal ports internal to the MCM (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports") and each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") coupling to SAS devices external to the MCM and wherein the number is sufficient to provide a total ports numbering substantially equal to the predetermined number of ports (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17);

Disposing an internal fabric on the MCM (Bakke '532, Figure 4, see connection between Subractive Routing Ports 120);

Disposing a coordination logic communicatively coupled to the plurality of SAS expander component circuits to coordinate operation of the plurality of SAS expander component circuits (Bakke '532, Page 2, paragraph 22, receipt of data from one of the devices causes the edge expanders to use logic to determine where the data is to be sent, therefore it would be obvious to one of ordinary skill in the art that there is coordination logic within the edge expanders).

Bakke '532 does not expressly teach configuring the routes between the total ports remains static at least until the MCM is reset, and

Wherein the coordination logic is adapted to present a single expander to devices outside the MCM.

In the same field of endeavor, Badamo teaches configuring an internal fabric to provide desired routes between the total ports wherein following the step of configuring, the routes between the total ports remains static at least until the module is reset (Badamo, Figure 3, item 20, Page 4, paragraphs 0041 and 0043).

Also in the same field of endeavor, Seto teaches wherein coordination logic is adapted to present a single expander to devices outside a module, wherein the coordination logic circuit performs SCSI management protocol ("SMP") exchanges (Seto, Figure 2, item 38c, Page 2, paragraph 0014) as a single address for a customized SAS expander (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

The motivations that were used in the combination of Claim 1, super, apply equally as well to Claim 18.

3. **Claims 6-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakke '532 in view Badamo and Seto as applied to Claim 1 above (hereinafter "BBS"), in further view of Barrow et al. ("Barrow") (U.S. Patent Publication No. 2002/0188786).

BBS discloses the invention substantially as claimed.

BBS discloses the module of Claim 1.

Regarding Claim 6, BBS does not expressly disclose wherein an internal fabric is initially configured at reset of the MCM.

In the same field of endeavor (e.g. a data storage system which consists of communications between the system and external data exchanging devices), Barrow teaches an internal fabric (Barrow, Figure 5, item 302, Page 5, paragraph 38) that is initially configured at reset (Barrow, Page 5, paragraph 44) of an MCM (Barrow, Figure 3, item 26, Page 3, paragraph 25).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Barrow's teachings of a data storage system which consists of communications between the system and external data exchanging devices with the teachings of BBS, for the purpose of decreasing latency in moving data from external devices to the data storage system and vice versa (see Barrow, Page 1, paragraph 5). BBS provides motivation to combine by stating it is an object of the invention to implement resilient connectivity in a data processing network (see Bakke '532, Page 1, paragraph 11).

Regarding Claim 7, Barrow teaches a control logic circuit (Barrow, Figure 5, item 308, Page 5, paragraphs 38 and 43) to configure the internal fabric at reset of the MCM (Barrow, Page 5, paragraph 44).

The motivation that was used in the combination of Claim 6, super, applies equally as well to Claim 7.

Regarding Claim 8, Barrow discloses wherein the internal fabric (Barrow, Figure 5, item 302, Page 5, paragraph 38) comprises a programmable fabric (Barrow, Page 5, paragraph 42).

The motivation that was used in the combination of Claim 6, super, applies equally as well to Claim 8.

Regarding Claim 9, BBS discloses a SAS device (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17) coupled to an external port (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") of a SAS expander of an MCM (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders").

BBS does not expressly disclose wherein a programmable fabric is adapted to be configured by information from a SAS device coupled to an external port of a SAS expander of the MCM.

In the same field of endeavor, Barrow teaches wherein a programmable fabric (Barrow, Figure 5, item 302, Page 5, paragraph 38) is adapted to be configured by

information received from an external device (Barrow, Page 5, paragraph 42, the switch fabric 302 may be configured by I/O interfaces or control interfaces).

The motivation that was utilized in the combination of Claim 6, super, applies equally as well to Claim 9.

Relevant Art

4. "Serial Attached SCSI Link Layer – part 2", by Rob Elliot, HP Industry Standard Servers, 30 September 2003, retrieved from the Internet on 7/20/2006 at <http://www.scsita.org/aboutscsi/sas/tutorials/SAS_Link_layer_2_public.pdf>, is cited as Relevant Art.

Response to Arguments

5. Applicant's arguments filed October 25, 2006 regarding the limitation "multi-chip module" (see Pages 6-10 of Applicant's Remarks/Arguments) have been fully considered but they are not persuasive. Applicant argues that the prior art does not teach a multi-chip module. On the contrary, this is in fact taught Bakke et al. (U.S. Patent Application Publication No. 2005/0071532) as Figure 4, item 100. Bakke et al. teaches multiple chips (Figure 4, items 0, 1, 102) disposed onto a module (Figure 4, item 100). Specifically in referring to Figure 4, item 100, the examiner was attempting to point to the two edge expanders as the "module". The examiner maintains that with regard to Applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e.,

Applicant's specific characterization of a MCM ["a single integrated circuit that is manufactured to incorporate one or more other integrated circuit dies or components"]) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Given the broadest reasonable interpretation and the plain meaning of the term "multi-chip module" (ie. any module containing multiple chips), the rejection is appropriate. See MPEP 2111.01.

6. Applicant's arguments with respect to the limitation "coordination logic" in claim 1 has been considered but is not persuasive. According to the broadest reasonable interpretation, Bakke '532 does in fact teach this limitation (ie. receipt of data from one of the devices causes the edge expanders to use logic to determine where the data is to be sent, therefore it would be obvious to one of ordinary skill in the art that there is coordination logic within the edge expanders). Applicant's argument with respect to newly-added limitation "wherein the single expander performs SCSI management protocol ("SMP") exchanges as a single SAS address" have been considered, but are moot in view of the new ground(s) of rejection.

7. Applicant's arguments with respect to the limitation "wherein the configuration of coupling together of the selected ones of the internal ports is static following initialization of the MCM" have been considered but are not persuasive. Applicant argues that element 20 of Badamo "is anything but static". The examiner disagrees. Contrary to Applicant's argument, Badamo specifically uses the term "static" in describing the fabric card 20, see Page 4, paragraph 0041 ("This routing can be configured statically ...") and

also paragraph 0043 ("the assignment of LCs 22 to SCs 24 [by FC 20] is static, but programmable"). Further, with regard to Applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., wherein "couplings/routes ... remain static *for the remaining period of operation*") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims: See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, the rejections to Claims 1-9, 12-14, and 17-18 as being unpatentable under 35 USC 103(a) stand, to the extent they have been claimed.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faisal Zaman whose telephone number is 571-272-6495. The examiner can normally be reached on Monday thru Friday, 8 am - 5:30 pm (every-other-Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on 571-272-3632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

fmz

MARK H. RINEHART
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100